REMARKS/ARGUMENTS

Reconsideration and continued examination of the above-identified application are respectfully requested.

Upon entry of this amendment, claims 1-63 remain pending in this application. No claim has been canceled, withdrawn, or added. Claims 1, 30-33, 43, and 52-55 have been amended.

Clarifying amendments are made to claim 1 based on the subject matter of its dependent claims 18-28, and corresponding descriptions in paragraph [0032] at pages 11-12 of the present application. Claims 30-33 (and claims 52-55) are editorially amended to recite the "solder" or "braze" qualifier for each recitation of metal or alloy. Claim 43 has been amended to incorporate a recitation regarding a solder alloy, solder metal, braze alloy, or braze metal is disposed between said member having said grooves and said member having said projections, which is based on the subject matter recited in its dependent claims 52-55. Claims 52-55 also have been amended to reflect the antecedent provided in their parent claim. Therefore, no new issues are raised by the amendment that would require further consideration or search. The amendment also would simplify issues for appeal, if taken. No new matter is introduced. Entry of the amendment is considered appropriate at this time, and notification of such entry is respectfully requested.

Interview Summary

Applicants thank Examiner McDonald for the courtesy of the telephone interview conducted on April 9, 2007 with one of Applicants' representatives, Ramon R. Hoch (Reg. #34108), in which the present application was discussed. During the interview, claim amendments were discussed (the Examiner was provided in advance with an unofficial copy of the proposed Amendment), which are presented herein for entry. Claims 1, 30-33, and 43 in particular were discussed during the

interview. The differences between the primary reference of Ivanov '863, and its combination with the secondary reference of Kunihiro et al., relative to the proposed amended claims were discussed. The arguments presented by Applicants' representative during the interview in this respect are incorporated below in this written response to the rejections, and reference is made thereto.

Rejection of Claims 1-4, 7-13, 29, 43-48, 51, 56, and 59-63 under 35 U.S.C. §102(b) – Ivanov et al. (WO 00/15863)

At pages 2 and 12-13 of the Final Office Action, the Examiner rejects claims 1-4, 7-13, 29, 43-48, 51, 56, and 59-63 under 35 U.S.C. §102(b) as being anticipated by Ivanov et al. (WO 00/15863). The Examiner again asserts that Ivanov et al. teaches each of the limitations of the rejected claims. In reply to Applicants' previous arguments submitted November 1, 2006 that Ivanov '863 fails to teach that the member having the grooves is a metal having a melting point higher that that of the metal which is comprised of projections, the Examiner argues that in Figs. 2-5, Ivanov '863 teaches a grooved member which can be joined to a member having projections, wherein the member having projections "can" be an aluminum target and the member having grooves "can" be a copper target. For this scenario, the Examiner urges that aluminum has a melting point of about 660 degrees Celsius and copper has a melting point of about 1084 degrees Celsius such that the member having the projections has a "higher" melting point that the member having the grooves (citing page 7, lines 7-31 and Figs. 2-5).[1] This rejection is respectfully traversed.

Amended claim 1 of the present application recites a method of forming a sputtering target assembly comprising a backing member and a target member reciting several steps, including, importantly, that the member having the grooves is a metal having a melting point higher than that

[1] If the Examiner's theory of the rejection is understood properly, apparently "higher" was meant to be "lower." Clarification is kindly requested if the rejection is repeated.

of the metal which comprises the projections, and the target and backing member are slidably contacted effective to generate frictional heat that softens and deforms the projections such that they partially fill at least one groove on the other member, which upon cooling and hardening, form a mechanical bond therewith. Put another way, the member having the projections is created from a metal that has a lower melting temperature or is a softer metal compared to the metal forming grooves and therefore, the projections deform when contacting the grooves formed from a metal with a higher temperature generated by localized frictional heat associated with slidable contact provided between the target and backing members. This is the total opposite of Ivanov '863.

Ivanov '863 does not identically disclose present claims 1-4, 7-13, 29, 43-48, 51, 56, and 59-63. Ivanov '863 is directed to the use of "cold pressing" and a "low temperature pressure consolidation" approach for joining the target and backing members (e.g., see page 3, line 25 to page 4, line 2; page 6, lines 3-5, 13-16). According to Ivanov '863, prior diffusion bonding techniques led to undesirable growth in grain size of low melting point targets, and the Ivanov '863 reference indicates that a low temperature target bonding approach is needed to avoid inducing such grain growth (see page 3, lines 9-13). Ivanov '863 therefore indicates heating of the target members should be avoided. Ivanov '863 teaches away from the present invention. The present invention encompasses embodiments where frictional heating can be generated in a controlled localized level effective to join targets and backing members to provide a fully suitable target assembly, contrary to the thinking of Ivanov '863.

Further, based on Applicants' review of the reference, the aluminum target with projections and copper backing member scenario proposed by the Examiner in the Final Office Action is not taught or suggested by Ivanov '863. The disclosure of the "second embodiment" of a target/backing plate assembly at page 7, lines 7-31 of Ivanov '863 that is relied upon in the Final Office Action is

devoid of any specific teaching of an aluminum target mated with a copper backing plate, much less an aluminum target with projections having a lower melting point than a grooved copper backing plate mated therewith. At page 7, lines 13-15 of Ivanov '863, it states:

> A plurality of salient portions of projections 8b are formed on the harder of either one of the surfaces 11b [bottom side of target 2b] or 13b [top side of backing plate 4b].

Ivanov '863, at page 7, lines 13-15, teaches that the projections are formed on the *harder* of the target and plate surfaces, which is opposite to the presently claimed invention. Ivanov '863 has a similar instruction provided at page 8, lines 15-20.

Amended claim 43 of the present invention recites a sputtering target assembly, comprising a member having a bonding side with a plurality of projections; and a member having a bonding side with a plurality of grooves, wherein said member having said grooves is a metal having a melting point higher than that of the metal which comprises said projections, and wherein at least one groove is substantially filled by at least one projection such that said members are at least mechanically bonded together, and wherein a solder alloy, solder metal, braze alloy, or braze metal is disposed between said member having said grooves and said member having said projections. Method claims 30-33 also recite the presence of such a solder material disposed between the members.

As explained in the present specification, the presence of the braze or solder metal or alloy can strengthen or permit the bond between the contact surfaces, and can require less energy to form the desired bond than friction welding *per se* (page 14, lines 3-4, 9-11). For example, friction brazing can require from about 1 to about 90% less energy to form a similar bond by friction welding *per se*. As acknowledged in the Final Office Action, Ivanov '863 does not teach the use of a solder material on at least one groove. Further, since Ivanov '863 is directed to the

use of "cold pressing" and a "low temperature pressure consolidation," as discussed above, this fact teaches away from the Examiner's proposed reliance on the Kunihiro et al. reference as suggesting modifying Ivanov '863 to include use of soldering materials. As explained above, Ivanov '863 teaches away from its combination with any other references that require heating as part of a multi-member joinder process.

Dependent claims 2-4, 7-13, 29, 44-48, 51, 56, and 59-63 are patentably distinguished from Ivanov '863 for at least the same reasons as explained above relative to their ultimate respective parent claims. Further, Applicants have pointed out additional differences between the present claims and Ivanov '863 in their previous response of November 1, 2006, which are incorporated herein by reference to avoid burdening the record with redundancies.

In view of the above, reconsideration and withdrawal of the rejection are respectfully requested.

Rejection of Claims 5, 6, 14-28, 30-42, 49, 50, 52-55, 57, and 58 under 35 U.S.C. §103(a) – Ivanov et al. (WO 00/15863) in view of one or more of Ivanov et al. (WO 02/47865), or Ivanov (WO 02/49785), or Stellrecht (U.S. Patent No. 5,342,496), or Kunihiro et al. (JP 61-291967), or Wegmann (U.S. Patent No. 4,983,269), or Hunt (U.S. Patent No. 5,836,506), or Ohhashi (U.S. Patent No. 5,693,203).

At pages 6-16 of the Final Office Action, the Examiner rejects claims 5, 6, 14-28, 30-42, 49-50, 52-55, 57, and 58 under 35 U.S.C. §103(a) as being unpatentable over Ivanov et al. (WO 00/15863) in view of one or more of Ivanov et al. (WO 02/47865), or Ivanov (WO 02/49785), or Stellrecht (U.S. Patent No. 5,342,496), or Kunihiro et al. (JP 61-291967), or Wegmann (U.S. Patent No. 4,983,269) or Hunt (U.S. Patent No. 5,836,506), or Ohhashi (U.S. Patent No. 5,693,203).

The deficiencies of Ivanov et al. '863, as described above, apply equally here, and none of the secondary references, alone or in any combination proposed in the Final Office Action, overcome these deficiencies. Accordingly, since each of the rejected claims is dependent ultimately

on claim 1 or claim 43, this rejection should be withdrawn. For example, and relative to claims 30-33 and 52-55 reciting additional soldering features, Ivanov '863 teaches away from its combination with references involving heating such as Kunihiro et al., as explained above. Further, the comments distinguishing each of these rejections from the claimed invention as set forth in the response filed November 1, 2006 are incorporated in their entirety by reference herein.

For these reasons, these rejections should be withdrawn as well.

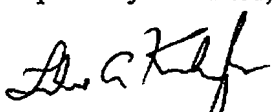
The Examiner is encouraged to contact the undersigned should there be any remaining questions as to the patentability of the claimed invention in view of the cited references.

CONCLUSION

In view of the foregoing remarks, the applicant respectfully requests the reconsideration of this application and the timely allowance of the pending claims.

If there are any fees due in connection with the filing of this response, please charge the fees to Deposit Account No. 03-0060. If a fee is required for an extension of time under 37 C.F.R. § 1.136 not accounted for above, such extension is requested and should also be charged to said Deposit Account.

Respectfully submitted,



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